ARMY GROUND RISK-MANAGEMENT PUBLICATION

# COUNTERMEASURE

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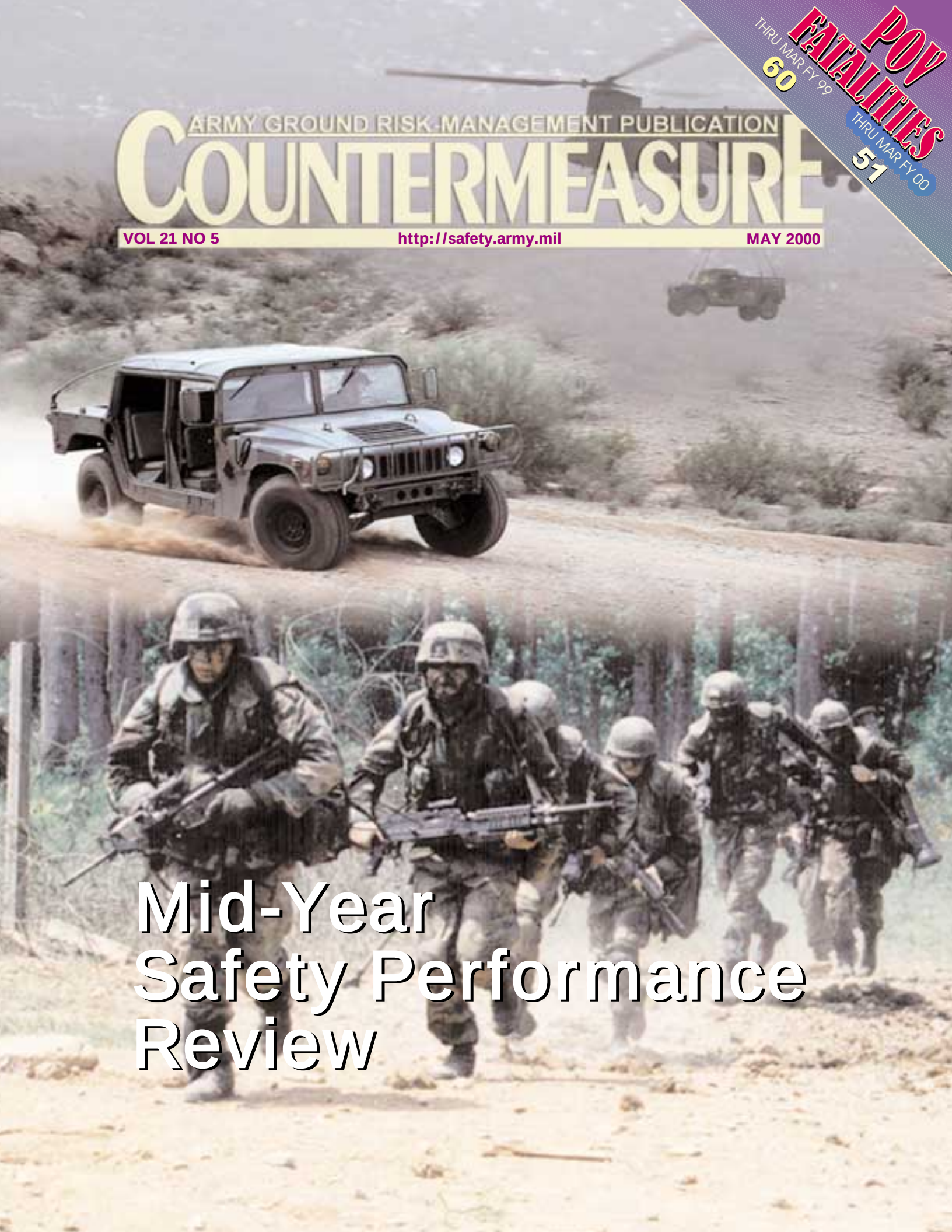
POV FATALITIES

THRU MAR FY 99 60

THRU MAR FY 00 51



# Mid-Year Safety Performance Review

ARMY GROUND RISK-MANAGEMENT PUBLICATION
# COUNTERMEASURE

The Official Safety Magazine for Army Ground Risk-Management

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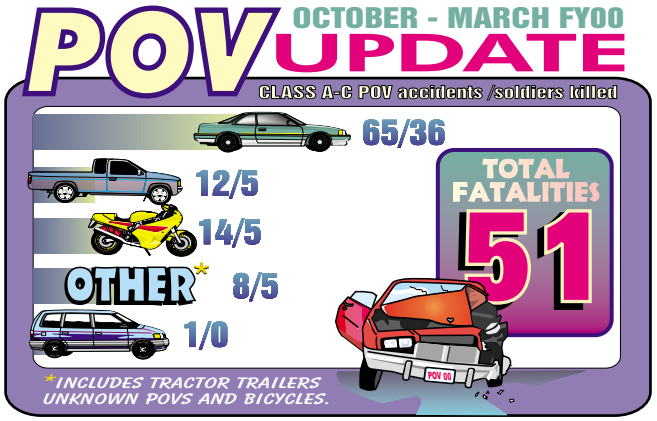


U.S. ARMY SAFETY CENTER

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**Gene M. LaCoste**
**Brigadier General, U.S. Army**
**Commanding Officer**

# Good News!

There's good news from the Safety Center operations research systems analysts. A mid-year review of the Army Safety Program showed that the Fiscal Year (FY) 2000 accident rates are lower than FY 99 and the previous 3 years.

Relative to this time last year, we are seeing reductions in the number of accidents in nearly every category: total aviation/ground accidents, military fatalities, ground off-duty accidents, and privately owned vehicle (POV) accidents. These numbers are direct results of leaders integrating risk management into training and battlefield operations, as well as off-duty safety.

As of 31 March 2000, total aviation and ground Class A accidents are 10.1 percent lower than FY 99 and equal to the 3-year average. Total military fatalities are also reduced 7.5 percent from last year, but still 1.4 percent higher than the 3-year average.

In the total ground accident category, we have a 7.4 percent reduction in the accident rate from last year. The biggest reduction came in Class A POV accidents.

Leadership involvement is making a positive impact on off-duty safety. Fiscal Year 2000 POV accidents are down 22.1 percent from the previous year and 4.6 percent down from the 3-year average. Military fatalities from POV accidents are down 19 percent from FY 99 and down 1.9 percent when compared to the 3-year average.

Despite this progress, some trends remain constant. The profile of our most at-risk soldiers remains the 19- to 24-year-old males, E2 through E5. These young soldiers have yet to realize their mortality; they consistently underestimate their personal risk and are overconfident in their personal ability.

Individual discipline remains a factor in the severity of POV accidents. Twenty-three percent of soldiers killed in off-duty POV accidents during FY 99 were not wearing seatbelts or motorcycle helmets. Unfortunately, this trend continues.

The Chief of Staff, Army, has directed that every soldier be trained on risk management by 1 July 2000. The Safety Center has developed an excellent chain-teaching packet on compact disk that is available now for commanders and small unit leaders. Contact

Dr. Brenda Miller, DSN 558-3553 (334-255-3553) or e-mail millerb@safety-emh1.army.mil if you have not received a CD.

As we move into the "101 Days of Summer," the critical time of year when we normally suffer the greatest number of accidents, what can we do to ensure this positive mid-year trend continues?

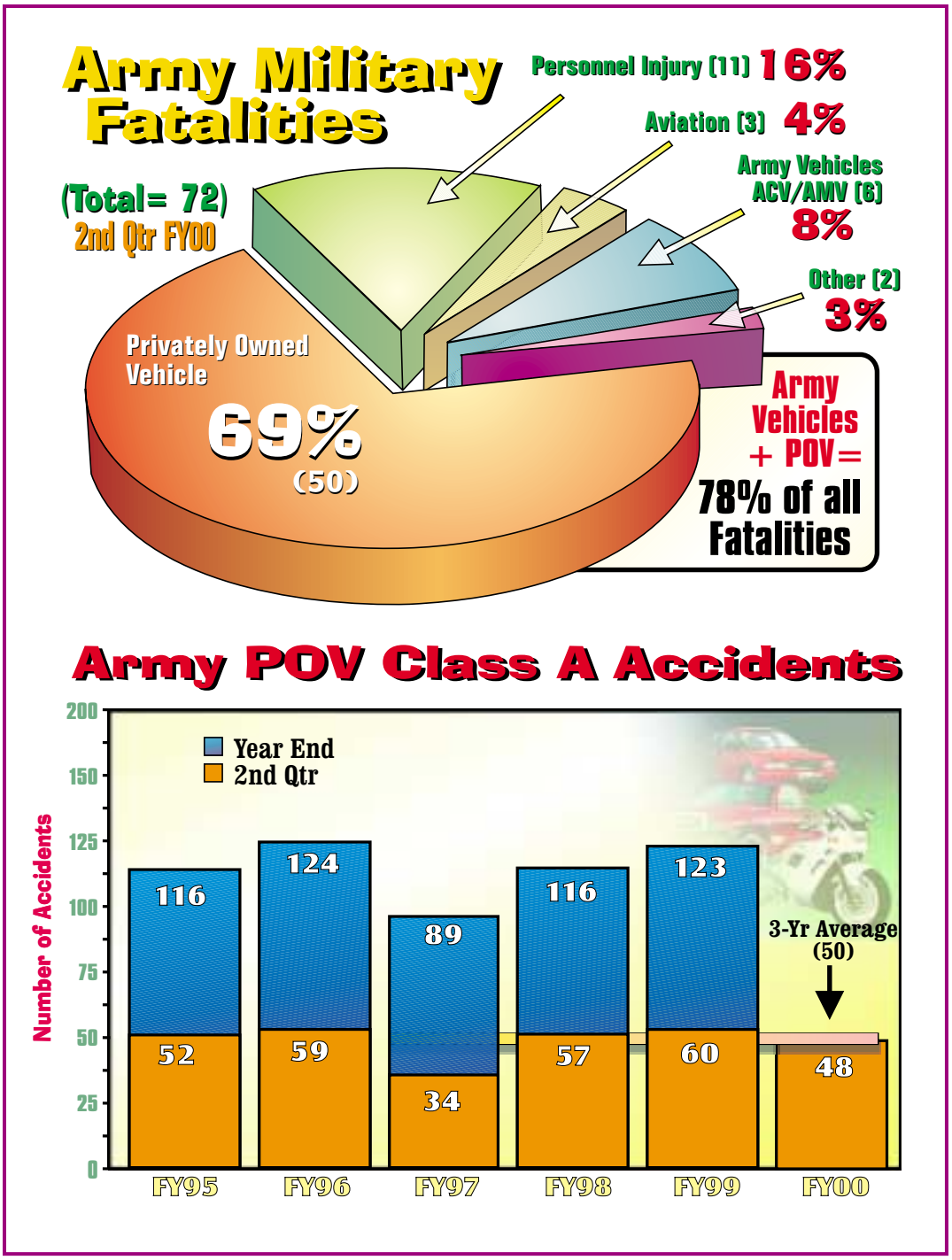
As evidenced by the lower accident rates in FY 00, leadership is making a difference and we must continue to emphasize leadership, standards, and discipline. Leaders at all levels must be on the front lines to look for ways to break the chain of events that leads to an accident.

Our focus on discipline (seatbelt use, drinking and driving, complacency, violation of rules/standards) must continue and complement our emphasis on the proper application of risk management techniques.

Most accidents are due to identifiable and predictable causes, not from uncontrollable circumstances. Let's continue to meet this year's challenge head-on by remembering that risk management is everyone's responsibility. So far, it shows and it's saving lives. And that's good news!

***NOTE:*** *The statistical data reflects cumulative information beginning on 1 October through 31 March of each fiscal year.* ♦

**For questions concerning statistical data, contact Mr. Ed Heffernan, Safety and Occupational Health Manager, DSN 558-2970 (334-255-2970), hefferne@safety-emh1.army.mil**



# NCO Corner

## Driver Training is NCO Business

An NCO's most important responsibility as a leader is to take care of his soldiers. That's just as true during peacetime as during combat. Sure, NCOs have to accomplish the mission, but if they try to do it regardless of the risks, eventually they won't be able to do it at all.

Before a soldier climbs behind the wheel of a vehicle, somebody had better have assessed the risks: Has the driver been trained? Is he qualified on the equipment? How much experience does he have? Are there weather or road hazards, or other special hazards that may require more experience or supervison? It's the NCO's responsibility to know the answers. If the answers to these and other questions indicate the risks are too high, the NCO is the one who needs to do something about it. If he can reduce the risks so the benefits of performing the mission outweigh the risks, then the mission is executed. But the NCO still has to supervise to be sure the controls are put in place and implemented.

Not only must NCOs ensure that their soldiers are trained to standard, they must hold soldiers responsible for having the necessary technical and tactical competence to do the job. NCOs have to ensure that soldiers know the standard for the tasks they are to perform and that they have the self-discipline to perform to standard. If the NCO fails in any one of these areas, soldiers can get hurt or killed. It's a tough job, but as any NCO will tell you—it's tougher to lose a soldier in an accident.

The next time you are tasked to put someone behind the wheel of an Army vehicle, begin with a risk assessment to see how safe the task or mission is. We owe it to our soldiers to give them the best driver training that's possible and to put the best driver behind the wheel of Army vehicles. ♦

**POC: MSG Timothy Sprucebank, Senior Wheel Vehicle SME, USASC Ground Systems and Accident Investigation Division, DSN 558-3774 (334-255-3774), sprucebt@safety-emh1.army.mil**

## Driver's Training. . .More Important Than Ever

If you want well-trained truck drivers behind the wheel, you've got to put the best information between their ears. Get that information for your unit in the form of training circulars (TCs), television tapes (TVTs), and computer-based instruction programs distributed on compact discs (CDs).

**Here's what is available through your publication person:**

**TRAINING CIRCULARS**

| | |
|---|---|
| 21-305 | Wheeled Vehicle Accident Avoidance |
| 21-305-1 | Heavy Expanded Mobility Tactical Truck (HEMTT) |
| 21-305-2 | Night Vision Goggle Driving Operations |
| 21-305-3 | M939-series 5-ton Cargo Truck |
| 21-305-4 | High Mobility Multipurpose Wheeled Vehicle (HMMWV) |
| 21-305-5 | Equipment Transporters (Heavy, Medium and Light) |
| 21-305-6 | Tractor and Semitrailer (M915, M931 and M932) |
| 21-305-7 | Light Vehicles |
| 21-305-8 | Medium Vehicles |
| 21-305-9 | Heavy Equipment Transporter System |
| 21-305-10 | Palletized Loading System (PLS) |
| 21-305-11 | Family of Medium Tactical Vehicles |
| 1-305-100 | Military Commercial Driver's License Driver's Manual |

***All these TCs are available on the Internet in the Army Doctrine and Training Digital Library (ADTDL) at http://www.adtdl.army.mil***

**The following items were distributed to local TASC, USAR MACOMs, USAR training centers, and state adjutants general.**

## TELEVISION TAPES

| TVT | PIN | Title |
|---|---|---|
| 55-15 | 709184DA | Operation of the HMMWV |
| 55-16 | 709233DA | Driving the M939A2-series Cargo Truck |
| 55-17 | 709234DA | M931 PMCS (Part 1) and M931 Driving (Part 2) |
| 55-18 | 709235DA | M915 PMCS (Part 1) and M915 Driving (Part 2) |
| 55-19 | 709236DA | C-HET PMCS |
| 55-20 | 709237DA | C-HET Coupling and Uncoupling |
| 55-21 | 709238DA | C-HET Loading and Unloading the M1A1 Tank |
| 55-22 | 709239DA | C-HET Driving |
| 55-23 | 709710DA | HEMTT PMCS |
| 55-24 | 709711DA | HEMTT Winch Operations |
| 55-25 | 709712DA | HEMTT Crane Operations |
| 55-26 | 709713DA | HEMTT Driving Techniques |
| 55-27 | 709528DA | Driving a HMMWV Equipped with CTIS |
| 55-36 | 710046DA | PLS Truck PMCS (Part 1), PLS Driving Techniques (Part 2), and PLS Crane Operations (Part 3) |
| 55-37 | 710336DA | PLS Load Handling System (Part 4) and PLS Winch Operations (Part 5) |
| 55-48 | 710750DA | HETS, PMCS for M1070 Tractor and M1000 Semitrailer |
| 55-49 | 710751DA | HETS, Coupling/Uncoupling M1070 Tractor and 1000 Semitrailer |
| 55-50 | 710752DA | HETS, Loading/Unloading M1070 Tractor and M1000 Semitrailer |
| 55-54 | 710939DA | Family of Medium Tactical Vehicles (FMTV) Driving Techniques |
| 55-55 | 710940DA | Family of Medium Tactical Vehicles (FMTV) PMCS |
| 20-928 | 708983DA | Preparation and Use of the AN/PVS-5 Series Night Vision Goggle |
| 20-929 | 708929DA | Preparation and Use of the AN/PVS-7B Night Vision Goggle |

## COMPACT DISCS

| CD | PIN | Title |
|---|---|---|
| CDR55-01 | 711259 | Wheeled Vehicle Accident Avoidance |
| CD 55-15 | None | M1083, 5-Ton Medium Tactical Vehicle (MTV) |
| CD 55-16 | None | M977 Heavy Expanded Mobility Tactical Truck (HEMTT) |
| CD 55-17 | None | M1070/M1000 Heavy Equipment Transporter System (HETS) |
| CD 55-18 | None | M998 High Mobility Multipurpose Wheeled Vehicle (HMMWV) |
| CD 55-19 | None | M35A3C, 2.5 Light Truck |
| CD 55-20 | None | M915, 14-Ton Tractor and Semitrailer |
| CD 55-21 | None | M939, 5-Ton Tactical Cargo Truck |
| CD 55-22 | None | M813, 5-Ton Tactical Cargo Truck |
| CD 55-23 | None | M1074 Palletized Load System (PLS) |

These TVTs and CDs can also be ordered over the Internet from the Defense Instructional Technology Information System (DAVIS/DITIS). The web site is **http://dodimagery.afis.osd.mil/**. Once there, click on Search DAVIS/DITIS and follow the ordering info.

You can also order by e-mail, fax or mail:

E-mail: vibuddy@hq.afis.osd.mil; Fax: DSN 795-6106 (570) 895-6106; Mail: Joint Visual Information Services, Warehouse 3/Bay 3, 11 Hap Arnold Blvd., Tobyhanna, PA 18466-5102

Include your name, full military mailing address, title and PIN number of the film, format (VHS, for example), and the quantity of films you need.

**POC: John Ritter, U.S. Army Transportation School, Ft. Eustis, VA, ritterj@eustis.army.mil**

# Too Fast For Conditions

On just about every evening's newscast, there is a report of an accident where a vehicle was *"going too fast for conditions."* The question that always comes to mind is "How fast is too fast?" Maybe the problem is not just the speed, but the equipment and the environment.

When we hear that phrase used, it usually refers to an Army truck accident. So, let's take a look at the equipment.

- Was the equipment properly maintained?
- Was the system properly set-up and equipped to meet the conditions expected to be encountered?
- Was the system designed to be "forgiving" of driver error?
- Were all the hazards of the vehicle identified and ways to reduce the risks developed and implemented (controls)?
- Was the driver properly trained to operate the equipment?

Not all Army vehicles are alike. There are many differences in vehicles of the same model series as well as in vehicles of different series.

## Fifth wheel

The cross-country fifth wheel differs from the highway fifth wheel in that it allows the trailer to oscillate side-to-side between 4.5 to 7 degrees (approximately 3 to 5 inches). In some series, some of the tractors will have cross-country fifth wheels and others will have highway fifth wheels. For example, the M915 and M915A1 have the highway fifth wheel, but the M915A2 has the cross-country fifth wheel.

## Hauling liquid cargo

A hazard that has recently been identified in accidents is liquid haulers, fuel or water. The hazards involved in pulling a low-bed trailer are different from those of liquid haulers. The reason is liquids react differently to the road

surface more than solid cargo. Tanker trailers operating full or empty handle much like any other trailer, but tanker trailers operating somewhere *between* empty and full act differently. The liquid moves, not only forward and backward but side-to-side, and that moving liquid has mass and weight. When the liquid load shifts on a curve, the mass and weight displaces the center of gravity, and the tractor and trailer can roll over.

## Environment

The environment also presents conditions that can cause good drivers to "commit an error" and have accidents. Although weather, in itself, is a hazardous environmental condition, in this article, we will focus on substandard road construction. These include interstate highways, state and county roads, dirt and gravel roads, and off-road cross-country. We all would like to think that the roads we travel have been constructed to the finest standards, but some have not.

Several years ago, a major interstate highway was constructed that included a tunnel under a river. The speed planned for the tunnel approach was 65 mph. During the first year, this stretch of interstate had five fatal accidents at the tunnel approach. Each time, the cause was listed as "*going too fast for conditions.*" It wasn't until a million-miler trucker (a driver who has driven more than a million miles without an accident or even a speeding ticket) had a wreck there that people began to ask questions. When they started looking into how the highway had been constructed, they found it was not built to design. Several changes had occurred after the roadway was planned and some drivers lost their lives because of this design flaw. Incidentally, the safe speed for the approach to this tunnel is now 40 mph.

## What it all means

When the equipment hazard (cross-country fifth wheel) is combined with the hazards associated with hauling a liquid tanker, experience with this particular type of equipment is everything. Drivers with many hours (even years) of experience in driving a tractor hauling solid cargo may not be qualified for hauling liquid cargo. It takes experience hauling liquid cargo before a driver acquires the feel of the tractor and the additional pushing and shifting of the weight on the rear axle so that he can safely operate this equipment.

## What to do:

- **Leaders.** Select and train your best soldiers as operators and look for drivers with many hours of experience in the vehicles you have in your TO&E. Instill a sense of discipline in implementing controls for hazards. Impose cross-country speed limits.
- **Master drivers.** Review your training plans for cross-country and highway fifth wheels. Study the test routes to determine if you can add the standardized test for cross-country fifth-wheel operation. Obtain and implement TC 21-305-100, dated 19 Aug 96, which requires drivers to be licensed in the operation of tanker trailers.
- **Drivers.** Review the operator's manual for your tractor as well as the operator's manual of the trailer for warnings and limitations of the trailers. Remember that the stricter controls, whether they are for the tractor or for the trailer, take precedence. If a tractor maximum speed is 40 mph and the trailer is 35 mph, then 35 mph is the maximum speed for the system. Review the operator's manual to ensure that you have the proper truck/trailer combination.
- **Installations.** Review curves, intersections, or sites where accidents are occurring to determine if the actual speed limits are "too fast for the conditions."
- **Individual.** Consider reducing speed for varying road or weather conditions. Don't tailgate. Always maintain a safe following distance. Stopping can be adversely affected by poor road and weather conditions. ♦

**POC: Donald Wren, Safety Engineer, USASC Ground Systems and Accident Investigation Division, DSN 558-1122 (334-255-1122), wrend@safety-emh1.army.mil**

# Attention master drivers:

Obtain and implement TC 21-305-100: *The Military Commercial Driver's License Driver's Manual*, dated 19 Aug 96, which requires drivers to be licensed in the operation of tanker trailers. ♦

Written by accident investigators to provide major lessons learned from recent centralized accident investigations.

# Investigators' Forum

## A Turn Turns Deadly

A light infantry unit was deploying to the field for a tactical training exercise. They received transportation support from the division support command in the form of M923A2 5-ton trucks with drivers to move their soldiers to the training site. Since they received fewer trucks than requested, the commander decided to move his unit in multiple lifts.

The first lift took elements of two platoons to the site without incident. The two trucks returned to the unit area in garrison to pick up the second group of soldiers. The unit commander sent a sergeant back with the lead truck to provide leadership to the drivers. The second lift consisted of 19 soldiers in the back of each truck, along with their duffle bags and rucksacks. Since the drivers' duffle bags were in the vehicle commander's seat of the second truck, the platoon leader chose to ride in the back with his other 18 soldiers.

### What went wrong?

The second lift departed the company area and headed for the training site. The route included a gravel tank trail. As they rounded a corner at about 10 mph over the posted speed limit, the second truck began to fish tail. It swerved to the left side of the road and then returned to the right. At this point, one of the rear wheels left the road and entered a small water-filled ditch. The driver steered to the left to pull the truck out of the ditch. When he did this, the truck overturned. It came to rest on its top, perpendicular to the roadway. The 19 soldiers in the back were injured, some seriously. The driver, who was not wearing his seatbelt, was pinned under the windshield frame and later died from his injuries.


### Lessons learned

This accident was caused by excessive speed and an improper reaction to an emergency situation. The vehicles were moving too fast on the tank trail. This led to the driver's

loss of control coming out of the curve. He improperly reacted to the departure of his vehicle's right side into the ditch. By oversteering, the vehicle's momentum led to the rollover.

Proper leadership on the part of the platoon leader could have prevented this accident. The senior occupant failed to assume his duties as required by AR 600-55 and other regulations. As a result, no one was in the cab to tell the driver to slow down or to wear his seatbelt.

The vehicles were overloaded. TB 9-369 defines the maximum passenger load in this type of truck is 16. These trucks each had 19 in the rear, with 3 soldiers riding on the baggage between the side rails. These three soldiers were not injured as a result of not being in a seat, but they could have been had the circumstances been different.

### Summary

Small unit leadership could have prevented this accident. The senior occupant of any vehicle needs to know and comply with the requirements in AR 600-55 in order to ensure that the vehicle is operated safely. Most unit SOPs require vehicle commanders in any vehicle—leaders need to ensure that these directives are enforced. Compliance with these simple rules could have saved the life of one soldier and prevented the injuries to 19 others.

## What Does Right Look Like?

The unit was participating in a combat training center rotation. The battalion headquarters, along with support elements, deployed for the exercise to provide a tactical operations center (TOC) in support of the brigade combat team. With the exception of the headquarters company, the remainder of the battalion stayed at home station.

A security element, comprised of soldiers from other companies in the battalion, was designated to provide security for the TOC. The security force was responsible for establishing and maintaining the perimeter, which included constructing a two-man fighting position with overhead cover.

On day zero of the rotation, the unit conducted the initial movement into the maneuver area. After conducting a convoy brief and a safety brief, they moved out of the staging area and closed on their assembly area just after 1200. While the TOC was being established, the security force secured the perimeter as planned. After confirming the location with the Sergeant of the Guard (SOG), three soldiers began constructing a two-man fighting position along the access road into the assembly area. While their intent was to build a fighting position, it would more accurately be described as a bunker.

The position was dug lengthwise on a four-degree slope. There was a layer of soft sand several inches in depth with hard-packed sand beneath it. After digging the hole, they built sandbag walls on the left and right sides. The left wall was a row of four sandbags (laid end-to-end) and stacked four high. To compensate for the downslope, the right wall was stacked five sandbags high, again with four sandbags laid end-to-end. A single row of five sandbags was placed on the front edge of the position with two additional sandbags placed on the right side to provide a level platform for the weapon. The rear wall consisted of a row of four sandbags, stacked two high, which extended from the left wall to the entry hole. Neither the front nor the back row provided any structural support to the position.

When the sandbag walls were completed, the soldiers laid three 4"x4"x8' stringers across the length of the position from the left wall to the right wall. They were spaced approximately 21 inches apart, center-to-center. No lateral supports were used. The stringers were laid directly on the sandbag walls with the ends of the beams reaching approximately three quarters of the way across the sandbags. Two sheets of 4'x4'x¾" plywood were laid on the stringers. They covered the plywood with sandbags for overhead cover. There were five rows of five sandbags on the plywood and five leftover sandbags were placed on top for a total of 30 sandbags comprising the overhead cover.

One of the soldiers checked the stability of the position by grabbing and

shaking the roof from the right side. It was deemed to be sturdy and a soldier occupied the position to pull the first guard shift.

A few minutes later, the SOG checked on the position. He recommended that the soldiers place a tarp over the back of the position to block the high winds that were blowing from the rear. The soldier pulling guard in the position was sitting on a 5.56mm ammunition crate when they began to place the tarp on the roof. He was wearing his Kevlar helmet and LBE. After unrolling the tarp and placing it across the back of the position, one of the soldiers lifted a sandbag off the roof to secure the tarp. When he placed the sandbag back on the tarp, directly above where the guard was sitting, the roof collapsed. The left side of the roof struck the soldier on the head and back, pinning him underneath. The soldier suffered a fractured vertebrae resulting in permanent paralysis from the waist down.

### What went wrong?

The position collapsed because it was not built to standard. Specifically, the stringers were improperly placed across the length of the position, spaced approximately 21" apart, and laid directly on the sandbags. No lateral supports were used. Thirty sandbags comprised the overhead cover. With an average weight of 38.5 pounds, it was estimated that the total weight on the roof was approximately 1,200 pounds.

The correct way to build overhead cover is to place supports lengthwise along the hole. They must be no closer than 12" from the edge of the hole and may need to be further away based on the depth of the hole. The supports should also be braced and dug in approximately one-half their height to provide additional stability. Once the supports are set in position, the stringers should be placed on top of the supports, across the position. While the maximum distance between stringers differs depending on the type of materials used, in this case they should have been placed no further than 10 inches apart (center-to-center). After placing the stringers securely on the lateral supports, the sheeting or 1" plywood can then be placed on top. This provides a stable platform to construct your 18" of overhead cover.


### Lessons learned

The question is why it was not built to standard. First, it was not because of a lack of materials. Sufficient class IV was available. Nor was it for lack of time. The unit was under no pressure to get it done quickly. It certainly wasn't for lack of an

established standard. Numerous references are available that define the standard for fighting positions and the unit had two of them on hand.

The reason it collapsed was because the soldiers didn't know the standard. The soldiers built the position as they had been trained. The design was similar to many they had built in the past. Their immediate supervisor didn't know the standard and therefore couldn't enforce the standard. The preconditions were met—training failure and leader failure.

- **Training Failure:** No fewer than three training opportunities were missed that might have prevented the accident. First, although every soldier receives instruction on this task during Basic Training, hands-on performance is not a requirement. Most commanders assume soldiers are proficient in this skill level-one task. These soldiers weren't and we missed an opportunity to prevent this accident.

Secondly, the task, *"Construct Individual Fighting Positions"* was a required event in both the FY97 and FY98 Notice for Common Task Testing. The skill level-two task, *"Supervise Construction of a Fighting Position"* was also included in the FY97 Notice. We missed multiple opportunities to prevent this accident by not ensuring that required training and performance testing was conducted to standard.

Finally, prior to the rotation, the unit identified the task as a weakness and programmed home station training to fix it. However, the train-up exercise was not properly planned, resourced, or executed. Another opportunity missed. The end result was that the soldiers didn't know what "right" looked like.

- **Leader Failure:** The soldiers' supervisor checked on the position numerous times as it was being built. He failed to correct the deficiency because he was not trained to standard. He had at least two references readily available that showed the correct method of constructing overhead cover. He didn't use them...and yet another opportunity missed to prevent this accident.

## Summary

Unfortunately, this was not a new accident. Since 1990, the Army has experienced no fewer than 14 serious accidents relating to fighting positions and bunkers. During Operation Desert Storm, three soldiers were killed and three more were injured when the bunkers they were in collapsed. Virtually all of these accidents were a direct result of improperly constructed positions. Training and leadership should have ensured that the soldier didn't leave that fighting position on a stretcher.

The standards for building fighting positions with overhead cover are well defined. Field Manuals 5-34 and 5-103, and Graphic Training Aid 5-8-1 define the standards for constructing fighting positions and protective positions (bunkers). Does your unit build them to standard? Ensure your soldiers and leaders know what "right" looks like—the consequences can be severe. ♦

**POC: USASC Ground Systems and Accident Investigation Division, DSN 558-3562 (334-255-3562)**

## Commander's Responsibilities (GTA 5-8-1)

- **Protect troops.**
- **Plan and select location of survivability positions.**
- **Improve and maintain unit survivability.**
- **Provide materials.**
- **Supervise construction.**
- **Inspect survivability position.**
- **Obtain technical advice from engineers, as required.**

27 MAY thru 5 SEPTEMBER


# DAYS OF SUMMER

## PLAN TO WORK AND PLAY SAFELY!

U.S. ARMY SAFETY CENTER